Third United Nations International Conference on the Peaceful Uses of Atomic Energy

A/CONF.28/A/743
SPAIN
February 1964
Original: SPANISH

Confidential until official release during Conference

Abstract

EXPERIMENTAL STUDIES OF URANIUM CARBIDE-HEAVY WATER LATTICES

E.R. Mayquez, J.L. De Francisco, F.Olarte, L.A. Buergo y R. Rocher
Junta de Energía Nuclear. Madrid

Natural uranium carbide fuelled haavy water moderated (organic cooled) lattices have been studied at the Laboratories of Junta de Energía Nuclear (J.E.N.).

The experimental device is made up of an aluminium vessel of about 2 m diameter and 2 m height with an leakage-proof top cover. The flux distribution measurements can be made at different pitches at the exhagonal lattice. A graphite thermal column with five 10 curies Sb-Be neutron sources provides an adequate neutron intensity. The measurements have been varried out at 8,5 9,5 and 10,5 inches. The UC fuel elements used are similar to those of a possible organic cooled power reactor. The results have been compared with measurement carried out with UO_2 fuel element.

Another series of measurements, with a progressibe substitution technique, have been done in colaboration with the Centre d'

Translation provided by courtesy of the submitting Government

Etudes Nucleaires de Saclay in the critical facility AQUILON II. Dificulties in the interpretation of results forced a modification of the fuel elements. Two series of measurements were carried out: 1st) fuel elements without organic coolant, 2nd) fuel elements with organic coolant but without pressure and vacuum tubes. The first provides information on the UC and the second outle hidrogenous coolant influence upon the reactivity. Because of the limited length of the fuel elements it was necessary, in some of the measurements, to account for a heavy water top reflector effect.

In addition to the intrinsic information provided by these measurements, they have been used to check an theoretical scheme of calculation.